

REACTOR TEMPERATURE CALCULATIONS

WABT – Weighted Average Bed Temperature

- Correlates to catalyst activity
- Critical parameter used for monitoring catalyst deactivation rates
- Calculation changes each time the reactors are loaded with catalyst

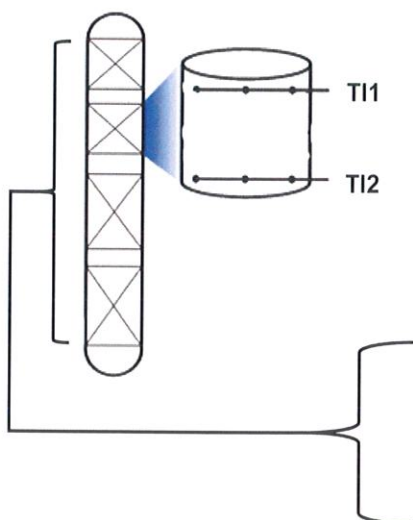
Delta T, temperature rise, axial bed rise

- Average bed outlet temperature – average bed inlet temperature
- Indication of heat of reaction

Radial temperature spread, radial DT

- Maximum – Minimum among temperature readings at the same level in the reactor
- Used as indication of flow distribution

WABT CALCULATION



CRACKING BED WABT CALCULATION:

$$\text{Bed ABT} = \frac{\text{Avg Inlet (TI1)} + \text{Avg Outlet (TI2)}}{2}$$

WABT of Reactor with 4 beds

BED	WEIGHT FRACTION OF CATALYST	ABT OF EACH BED	WEIGHT FRACTION X ABT OF EACH BED
1	0.1	385°C (725°F)	0.1 x 385°C
2	0.2	392°C (738°F)	0.2 x 392°C
3	0.3	391°C (736°F)	0.3 x 391°C
4	0.4	393°C (739°F)	0.4 x 393°C
Total	1.0	WABT (Reactor) = 391°C (737°F)	